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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,037	11/17/2003	Nicholas John Doran	048462-5003-01	1140

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EXAMINER	
LEE, DAVID J	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/713,037	DORAN ET AL.	
	Examiner	Art Unit	
	David Lee	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claim 1 recites in part, "no amplifier being disposed between a first pair of adjacent sections from sections from the plurality of sections and a second pair of adjacent sections from the plurality of sections." The specification does not disclose "a first pair of adjacent sections" and "a second pair of adjacent sections." Furthermore, nowhere is it disclosed that "no amplifier [is] disposed..." and paragraph 0029 of the instant specification seems to suggest the opposite: "The pulse evolution in lossy fibres can also be modelled by this equation as long as the amplification period is different from the period of dispersion management." Therefore, the added limitation of "no amplifier being disposed between a first pair of adjacent sections from sections from the plurality of sections and a second pair of adjacent sections from the plurality of sections" is deemed as subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claims 2, 3, and 18 recite in part, a system having "a first section having a dispersion, a second section having a dispersion of opposite sign from the dispersion of the first section, a third section having a dispersion and a fourth section having a dispersion of opposite sign from the dispersion of the third section, the second section being disposed between the first section and the third section without an intervening amplifier." The specification does not mention first, second, third, and fourth sections with certain dispersion signs. In addition, nowhere is it disclosed that the second section is "disposed between the first section and the third section without an intervening amplifier." Paragraph 0029 of the instant specification seems to suggest the opposite: "The pulse evolution in lossy fibres can also be modelled by this equation as long as the amplification period is different from the period of dispersion management." Therefore, the added limitation of "a first section having a dispersion, a second section having a dispersion of opposite sign from the dispersion of the first section, a third section having a dispersion and a fourth section having a dispersion of opposite sign from the dispersion of the third section, the second section being disposed between the first section and the third section without an intervening amplifier." " is deemed as subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6-9, 12-15, 17-19, 21-24, 27-30, 32, and 37-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Golovchenko et al. (US Patent No. 6,243,181 B1).

Regarding claim 1, Golovchenko teaches a method of communicating using optical pulses comprising: launching the pulses into an optical fiber communication system including a plurality of sections having dispersion of opposite sign (normal and anomalous fiber of fig. 2), the pulses being launched at a wavelength at which the system has normal average dispersion (see fig. 1C), no amplifier being disposed between a first pair of adjacent sections from sections from the plurality of sections (fig. 2: the first pair is fiber 40 and the fiber to its left) and a second pair of adjacent sections from the plurality of sections (fig. 2: the second pair is the fiber 50 and the fiber to its right; note that between the first pair and the second pair, there is no amplifier).

Regarding claim 2, Golvochenko teaches a method of communicating using optical pulses comprising: transmitting the pulses over an optical communications system including a plurality of sections having dispersion of opposite sign (normal and anomalous fiber of fig. 2), the pulses having a wavelength and a magnitude that allow the pulses to propagate in the system under normal average dispersion (see fig. 1C), a first pair of adjacent sections from the plurality of sections (fig. 2: the first pair is fiber 40 and the fiber to its left) being connected to a second pair of adjacent sections from the plurality of sections without an intervening amplifier, the first pair and the second pair being adjacent within the optical fiber communications system (fig. 2: the second pair is the fiber 50 and the fiber to its right; note that there is no intervening amplifier between the first pair and the second pair).

Regarding claims 3 and 18, Golvochenko teaches a method of communicating using optical pulses, the method comprising: transmitting the pulses over a dispersion-managed optical-fiber communication system including a first section having a dispersion (to the left of filter 30 of fig. 2), a second section having a dispersion of opposite sign from the dispersion of the first section (to the right of filter 30 of fig. 2; normal dispersion fiber 40), a third section having a dispersion (anomalous dispersion 50 of fig. 2) and a fourth section having a dispersion of opposite sign from the dispersion of the third section (to the right of amplifier 20 of fig. 2), the second section being disposed between the first section and the third section without an intervening amplifier (fig. 2: the second section – the normal dispersion fiber 40 has no intervening amplifier in its 35 km range), at least some pulses being transmitted at a wavelength at which the system exhibits normal average dispersion (see fig. 1C).

Regarding claims 4 and 19, Golvochenko teaches that the pulses are solitons (see Abstract).

Regarding claims 6 and 21, Golvochenko teaches that the communication system is dispersion managed using sections of fiber having anomalous dispersion (see fig. 2)

Regarding claims 7 and 22, Golvochenko teaches that the system is dispersion managed using sections of SSMF (standard) fiber and sections of DCF fiber (col. 4, line 36).

Regarding claims 8 and 23, Golvochenko teaches that the communication system is dispersion managed using alternative sections of fiber having opposite signs of dispersion (see fig. 2).

Regarding claims 9 and 24, Golvochenko teaches that the communication system is dispersion managed using dispersion compensating elements (see fig. 2).

Regarding claims 12 and 27, Golvochenko teaches that the communication system is dispersion managed using linear elements (see fig. 2).

Regarding claims 13 and 28, Golvochenko teaches that the system can be used as a WDM system (see Abstract).

Regarding claims 14 and 29, Golvochenko teaches that the communication system is a soliton-based communications system (see Abstract).

Regarding claims 15 and 30, Golvochenko teaches that the communication system has an asymmetric dispersion map (col. 2, lines 53-56; see also fig. 2).

Regarding claims 17 and 32, Golvochenko teaches that the pulse shape is determined according to a dispersion map of the communication system (see Abstract; see also col. 5, lines 1-10, lines 46-65, and col. 6, lines 3-5: note that the pulse shape is normalized to the intensity of an average soliton in the transmission line).

Regarding claims 37 and 39, Golvochenko teaches a method of communicating using optical pulses comprising: transmitting the pulses over an optical fiber communications system including a plurality of sections having dispersion of opposite sign (normal and anomalous fiber of fig. 2), the pulses having a wavelength and a magnitude that allow the pulses to propagate in the system under normal average dispersion (see fig. 1C), a bandpass filter being disposed within at least one section of normal dispersion from the plurality of sections (30 of fig. 2).

Regarding claims 38 and 40, Golvochenko teaches that the bandpass filter is disposed at a center of each of the at least one normal dispersion section from the plurality of sections (the filters in fig. 2 are considered to be "at a center" of the "section from the plurality of sections").

Claims 33-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Berkey et al. (US Patent No. 5,894,537).

Regarding claims 33-36, Berkey teaches a method of communicating using optical pulses comprising: transmitting the pulses over an optical fiber communications system including a plurality of sections having dispersion of opposite sign (fig. 1), the pulses having a wavelength and a magnitude that allow the pulses to propagate in the system under zero average dispersion (see Abstract).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golvochenko in view of Suzuki et al. (US Patent No. 6,005,702).

Regarding claims 5 and 20, Golvochenko teaches all the limitations as applied to claims 3 and 18 above including the limitation that the pulses are return-to-zero when launched (col. 7, line 9). However, Golvochenko does not expressly disclose that the pulses are phase modulated. Suzuki teaches that the pulses are phase modulated return-to-zero when launched (fig. 6, 31A and 33A). It would have been obvious to a skilled artisan at the time of invention to phase modulate the pulses as indicated by Suzuki in the system of Golvochenko in order to offset the deleterious effects from nonlinearities in the fiber transmission line.

Claims 10-11 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golvochenko.

Regarding claims 10-11 and 25-26, Golvochenko teaches limitations as applied to claim 3 above except for the limitation that the communication system uses circulators and is dispersion managed using optical gratings. Examiner takes official notice that dispersion managed systems using optical gratings and an optical circulator is well known and widely used in the art. One of ordinary skill in the art at the time of invention would have been motivated to use an optical grating and an optical circulator in the system of Golvochenko to compensate for nonlinear effects and to achieve higher quality compressed pulses. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a grating and a circulator in the system of Golvochenko.

Claims 16 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golvochenko in view of Ishikawa et al. (US Patent No. 5,717,510).

Regarding claims 16 and 31, Golvochenko teaches all the limitations as applied to claims 3 and 18 except for the limitation that the pulses are prechirped. Ishikawa discloses prechirping pulses (col. 18, lines 18-23). One of ordinary skill in the art would have been motivated to prechirp the pulses in order to elongate signal duration, to improve communication quality, and to improve the signal to noise ratio. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to prechirp the pulses as indicated by Ishikawa in the system of Golvochenko.

Response to Arguments

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new grounds of rejection.

Applicant's arguments regarding the prior art of Golvochenko have been fully considered but they are not persuasive.

Applicant argues that in Golvochenko's system, "*each* segment of normal dispersion fiber 40 and anomalous dispersion fiber 50 are connected by an intervening amplifier 10 or 20." However, it can clearly be seen from Figure 2 that *every other* segment of normal dispersion fiber and anomalous dispersion fiber is connected by an intervening amplifier. This gives examiner the grounds to consider the section between the normal and anomalous fiber to be without an amplifier, as is clearly illustrated in Figure 2. Furthermore, applicant argues that Golvochenko fails to teach a second section without an intervening amplifier. Again, referring to Figure 2, it is clearly illustrated that within the 35 km confines of the second section (i.e. – normal dispersion fiber 40), there is no intervention of an amplifier.

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER